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NOTE BY THE SECRETARY-GENERAL

The Secretary-General has the honour to transmit to the members of the Security Council the attached communication of 30 May 1994, which he has received from the Director General of the International Atomic Energy Agency (IAEA).

Annex

Letter dated 30 May 1994 from the Director General of the International Atomic Energy Agency addressed to the Secretary-General

Please find attached the report of the twenty-fourth IAEA inspection in Iraq under Security Council resolution 687 (1991). You may deem it appropriate to transmit the report to the members of the Security Council. I remain, of course, available with the Chief Inspector, Mr. Garry Dillon, for any consultations you or the Council may wish to have.

(Signed) Hans BLIX
Director General

Appendix

Report on the twenty-fourth IAEA on-site inspection in Iraq under Security Council resolution 687 (1991)

11-22 April 1994

SALIENT POINTS

The twenty-fourth IAEA on-site inspection in Iraq involved (i) the implementation of activities in connection with the ongoing monitoring and verification (OMV) plan, in particular the spring collection of surface water, sediment and biota samples; (ii) discussions with the Iraqi counterparts on the form and content of the inventory reports required by paragraphs 22 and 23 of the OMV plan and inspections at locations, particularly those which had a support role in the former nuclear weapons programme, in order to clarify details of the corresponding inventory reports prepared by Iraq; (iii) the assessment of the practical requirements for the installation of a video surveillance system to be installed in a machine-tool workshop; (iv) the examination of items of equipment, at the Al Qaim site, which Iraq had requested to be released for alternative usage; (v) clarification of matters related to the origin and usage of natural uranium. Regarding this latter activity, a visit was made to Al Jesira and to a related location, Al Adaya, to evaluate uranium losses as holdup in plant equipment. A total of 39 facilities, installations and sites were visited in the course of this inspection.

- Environmental monitoring is an integral part of the OMV plan and systematic sampling of water, sediment and biota samples along the Tigris and Euphrates watersheds has been carried out on a twice per year, spring and fall, basis

since the first (baseline) survey was completed in November 1992. The spring sampling programme carried out during this inspection involved the collection of samples at sixteen locations.

- Discussions were held with the Iraqi counterparts on the form and content of the inventory reports prepared by Iraq in accordance with paragraphs 22 and 23 of the OMV plan. Inspections were carried out at Tuwaitha and at 11 locations which had support roles in the former nuclear weapons programme, with the purpose of clarifying details in these inventory reports. Six additional locations where machine-tools, subject to monitoring in accordance with Annex 3 of the OMV are installed or stored, were visited for similar purposes. In addition an inspection was made, at short notice, at a facility listed as having a means of electrical power greater than 10MVA.

- Activities were carried out in connection with the planned installation of a video surveillance system in the flow forming machine workshop at Nassr. This installation, which should be completed in June 1994, will, in the first instance, involve some ten cameras connected to a central recording and control system.

- A large number of plant items from the former uranium extraction plant at Al Qaim were examined in order to be able to process a request for their release for use elsewhere on the Al Qaim site.

- At Al Jesira main site, a holding tank, 053, and scrapped equipment were inspected to evaluate their uranium content. Related to this, the Iraqi counterparts arranged for the excavation of equipment buried at the nearby Al Adaya site and provided technical assistance to enable an estimate of uranium

holdup to be made. Preliminary evaluation indicates a uranium holdup quantity of about 2600 kg. Findings support Iraqi statements that large processing losses are accountable as waste.

INTRODUCTION

1. This report summarizes the results of the twenty-fourth on-site inspection carried out in Iraq by the IAEA under the United Nations Security Council resolution 687(1991), with the assistance and cooperation of the Special Commission of the United Nations. The inspection took place from 11 to 22 April 1994 and was headed by Garry Dillon of the IAEA as Chief Inspector. The team consisted of 15 inspectors (comprising 11 nationalities).

2. The objectives of the inspection were:

   - the carrying out of the third regular campaign of collection of water, sediment and biota samples at selected locations along the Tigris-Euphrates watersheds as part of the environmental monitoring programme foreseen in the OMV plan.

   - to hold discussions with the Iraqi counterparts on the form and content of the inventory reports prepared by Iraq in accordance with paragraphs 22 and 23 of the OMV plan and to carry out inspections at facilities, installations and sites, which have been identified as having had a support role in the former nuclear weapons programme, for the purpose of in situ examination of the information contained in these inventory reports.

- similarly to carry out inspections at facilities, installations and sites at which are installed or stored equipment or materials subject to routine monitoring in connection with Annex 3 of the OMV plan.

- to design the physical arrangement and determine the components required for a video surveillance system which is planned to be installed in the flow forming machine workshop at Nassr with the objective of monitoring the nature of workpieces processed in that workshop.

- to examine those plant items remaining in the wreckage of the uranium extraction plant at Al Qaim for which a request for release for use elsewhere on the Al Qaim site had been made by Iraq.

- to continue work started in previous inspections regarding the origin and usage of natural uranium and in particular to make an assessment of the amount of natural uranium contained in Al Jesira waste tank # 053 and scrapped equipment.

Regarding this latter activity, in the early part of IAEA-24, the Iraqi counterparts offered to excavate some Al Jesira equipment which had been buried in 1991 at Al Adaya, some 30 kilometers south of the Al Jesira main site. This offer was in connection with their explanations that uranium not accounted for at Al Jesira was present as losses to waste and as holdup in equipment. Excavation was performed during and inspection completed at the end of IAEA-24.

3. The 39 facilities, installations and sites visited during the inspection are listed in Table 1.

ACTIVITIES IN CONNECTION WITH THE RADIOMETRIC HYDROLOGICAL SURVEY

4. As part of the ongoing environmental monitoring programme aimed at detecting emissions from undeclared nuclear activities (specifically handling of nuclear material, reactor operation, and/or spent fuel reprocessing), samples of water, sediment and biota were collected at sixteen locations in the Tigris and Euphrates watersheds. These samples will be subjected to radiochemical analysis and the results obtained will be compared with the results of the comprehensive baseline survey which was completed in November 1992.

5. No particular problems were encountered during this, the third successive spring/fall sampling campaign, although it should be recorded that established sampling points in the north and north-east of Iraq (Kurdish area) were again excluded from the sampling point selection process due to personnel security reasons.

ACTIVITIES IN CONNECTION WITH INVENTORY REPORTS PREPARED BY IRAQ IN ACCORDANCE WITH PARAGRAPHS 22 AND 23 OF THE OMV PLAN

6. A "test case" inspection was carried out at Tuwaitha in order to compare the information contained in the inventory reports received from Iraq in March and April 1994 with the actual situation observed at the site. Buildings 10, Analytical chemistry, 12, Physics and 90, Laser and electronics were selected for inspection and it was concluded that the information contained in the reports was essentially confirmed through inspection. The results of the inspection were discussed with the Iraqi counterparts and those areas where information was missing, inadequate or incomplete (e.g., maps and plans, design capabilities and activities) were brought to their attention.

7. The Tuwaitha inspection was used as the basis for a generic discussion on the form and content of the inventory reports and it was made clear that the information was incomplete with respect to design capabilities and activities. This was particularly relevant in the case of present day design capabilities and activities. The Iraqi counterparts undertook to provide more comprehensive information in these areas. It was also agreed that the information provided with respect to past activities would be summarized for each calendar year since 1989 and would be included in the "Notes" section of reports required under paragraphs 22.1 and 22.2 of the OMV plan. A set of updated reports were provided to the team during the High Level Technical talks held in Baghdad from 24 to 26 April 1994.

8. Inspections were carried out at eleven sites which had a support role in the former nuclear weapons programme viz: Al Zawra, Al Nida, Um Al Ma'arik, Nassr, Saddam State Establishment, Daura, Badr, Hatteen, Salah Al Din State Establishment, Al Qa Qaa and the IAEC Training Centre at Zaafaraniya.

9. The purpose of these inspections was, inter alia, to clarify the information contained in the inventory reports produced by Iraq in March 1994. In general it was found that the information contained in the reports would provide an adequate basis for the ongoing monitoring and verification activities although, as noted in paragraph 7 it was observed that the scope of the information provided for design capabilities and activities was in many cases minimal and would require further revision.

10. In the course of these inspections the location, type and, where relevant, amount of equipment and material declared in accordance with Annexes 2 and 3 of the OMV plan was checked against the IAEA listing and the actual

physical presence of the equipment or material. In general all sources of information were mutually consistent. Some inconsistencies were noted and were readily solved in discussion with the Iraqi side.

11. In the course of the inspections at the facilities listed in paragraph 8 and at other facilities (MIC storage, Taji Fiberglass, Taji Metallurgy Laboratory, Al Karama, Al Radwan) where equipment subject to routine monitoring in accordance with Annex 3 of the OMV plan was installed or stored a "first draft" machine-tool monitoring documentation system was tested. The documentation proved to be a sound basis for the recording of monitoring results and will be updated on the basis of the experience gained during this inspection and retested in IAEA-25.

12. Al Shaykili was revisited on 1994-04-21 to confirm the transfer of graphite from the Falluja Lead factory to building 13b for storage - the alkaline battery production facility at Falluja is not yet established. The inventory of equipment in the Al Shaykili stores was checked with particular reference to the vacuum pumps stored in building 13b.

13. A short notice inspection was carried out at the Military Research and Development Commission which is a facility declared to have a means of electrical power supply greater than 10 MVA. The facility is the site of a wind tunnel project the completion of which has been delayed due to the inability to import outstanding plant items such as electric motors. The facility's workshop was not equipped with any computer numerical controlled (CNC) machine-tools.

ACTIVITIES RELATED TO SURVEILLANCE EQUIPMENT INSTALLATION

14. The optimum locations for the cameras and control units for a multiplexed video surveillance system planned to be installed in the flow forming machine workshop at Nassr were studied on the basis of video recordings and environmental conditions. Severe difficulties were encountered due to the interference of sunlight and it proved necessary to repeat the study to locate a more acceptable camera position. This work was satisfactorily accomplished by a technical group which visited Iraq from 1994-05-14 to 1994-05-16. Preparations are now well in hand to complete the installation in the latter half of June 1994.

ACTIVITIES RELATED TO REQUESTS BY IRAQ FOR THE RELEASE OF EQUIPMENT

15. The work started during IAEA-23 to examine a large amount of salvageable equipment in the Al Qaim uranium extraction plant was completed. Notwithstanding its former use, the equipment comprises general purpose tanks, valves, pumps, motors and electrical switch gear common to any type of bulk liquid processing facility. A comprehensive listing of the equipment proposed to be salvaged was provided by the plant operator and nearly every item was examined by members of the inspection team. Thorough preparations by the plant operating staff in terms of plant item inventory, plant item tagging and the provision of safe access enabled the task to be completed quickly and efficiently. The equipment, if released, would be used elsewhere on the Al Qaim site and the operator has undertaken to maintain records of the location and usage of each item. Action is now in hand, in accordance with paragraph 25 of the OMV plan, to process the request. A

formal request for the release of equipment identified to the inspection team during IAEA-23 was received during IAEA-24 and will be similarly processed.

16. Shortly after IAEA-23, a request was received from Iraq for the release of approximately 20 tonnes of lead chevron bricks of a shielded glove box installed in building 64 at Tuwaitha, which were proposed to be transferred from Tuwaitha to the Falluja lead factory and melted down for eventual use in car batteries. This request was granted on condition that the dismantling operation, the transport to Falluja and the melting was witnessed by IAEA or UNSCOM staff. The dismantling and transport was witnessed during IAEA-24 and the melting was witnessed by UNSCOM staff on 1994-05-13. A quantity of lead bricks, estimated to be 8-9 tons, in addition to those from the building 64 glovebox, were noted at the waste treatment plant at Tuwaitha. The bricks were being cleaned and stacked. The counterparts were reminded to request its release as for the building 64 material and to provide documentation showing that the lead is not contaminated.

ACTIVITIES RELATED TO ORIGIN AND USE OF NATURAL URANIUM

CHARACTERIZATION AND ACCOUNTANCY

17. Two filter banks associated with uranium processing in the Building 73 complex of Tuwaitha were located and presented for inspection at Building 39. It was confirmed that these were the filter banks seen in Building 39 during an earlier inspection. Examination indicated that the filter housings appeared to have been cleaned and that the filter elements contained very little uranium. The housing was covered with a layer of caked earth which was also found to be on the tops of the filter elements although the covers were in place - no explanation for this was offered by the Iraqi counterparts. It was clear from the yellow uranium compound deposited on the inside walls of both housings that they had been used in an

intermediate stage of uranium chemical processing. Both housings and one filter were sampled. Additional filters containing a similar yellow powder were located in a wooden packing crate in Building 39. One was sampled.

18. Waste tank #053 at Al Jesira still contains uranium bearing sludge under a layer of organic waste and kerosene. The sludge was sampled, and consist of fine U03 powder and decomposed organic material distributed non-uniformly on the bottom of the tank. A preliminary estimate of tank contents is about 400 kg uranium.

19. An evaluation was made of the uranium holdup in equipment in the Al Jesira scrap yard. This work was facilitated by the Iraqi counterparts who provided resources to allow access to furnaces, tanks, etc. Some pieces of equipment, for example, the $U0_2$ and ammonium diuranate (ADU) rotary kilns contained considerable material. Bag houses, pipes and tanks contained material in varying amounts. The uranium content of the plant items stored at the scrap yard was estimated to be 300 kg.

20. A large amount of equipment and all the waste system piping from the Al Jesira UO_2 plant was buried in 1991 at the Al Adaya site some 30 km from the main site. The Iraqi side excavated the site and provided the resources to facilitate access to pipes and equipment to enable an estimate of the uranium holdup to be made. Pipes were cut open, examined and sampled. Estimated uranium holdup is about 1200 kg. Although estimation of waste pipe holdup was the initial objective, additional material was found in the form of bagged $U0_2$, ADU and in drums of waste. Equipment such as filters, tanks and vertical elevators also contained uranium. There was evidence of considerable potential holdup in process piping.

21. It is estimated that tank #053 plus the equipment and piping at the two Al Jesira sites contain about 2600 kg uranium with an error of ± 500 kg. The amount of material found supports the Iraqi statements that large quantities of U were lost to

waste due to equipment problems at the UO_2 plant. Other observations made during the inspection support statements that the loss occurred as fine particulate material from the filtering operation. At a closing meeting at Al Jesira, the Iraqis suggested that U values on waste material from tank #052 might be low due to settling of the fine particles during transportation to Location C. This will be investigated during the next inspection to try to resolve the outstanding balance of about 2500 kg uranium.

22. During the closing meeting of IAEA 24, the Iraqi side clarified information in Document B63 regarding the start of uranium metal production at Tuwaitha. They explained that, prompted by a literature review, they had implemented a development programme to convert UF_6 through UF_4 to metal as a means of managing the UF_6 tails that would result from their gaseous diffusion enrichment programme. Accordingly, in late 1986 and during the first half of 1987, laboratory scale 1 kg reductions using natural UF_4 were carried out in Building 15B at Tuwaitha to test the technology. The UF_4 was made by fluorinating Brazilian UO_2 with freon-12. The uranium metal produced from the reduction of UF_4 was subjected to physical and chemical analysis. The work was stopped after mid 1987 when the gaseous diffusion program was cancelled. The production of U metal in the first half of 1987 is consistent with inspection findings.

23. A very detailed estimate, with calculations, of uranium holdup in some pieces of equipment at Al Qaim was prepared and presented by the Iraqi side. At this time, the estimated holdup of about 550 kg uranium appears to be reasonable and in line with observations made during equipment checks.

24. Work was started to prepare procedures for the removal of 7 Tamuz-2 and 18 IRT-5000 beryllium elements from the IRT pond for storage at Location C. By the end of the inspection the 7 Tamuz-2 beryllium elements had been moved. The 18 IRT beryllium elements are expected to be moved during the next inspection.

Table 1

List of facilities, installations and sites inspected in IAEA-24

1.	Al Jesira (including Al Adaya)
2.	Al Karama
3.	Al Nida
4.	Al Qa Qaa
5.	Al Qaim
6.	Al Radwan
7.	Al Zawra
8.	Al Shaykili
9.	Badr
10.	Daura
11.	Hatteen
12.	IAEC Zaafaraniya Training Centre
13.	Ibn Al Haytham
14.	Iskandariya
15.	MIC storage (Baghdad)
16.	Military R&D Commission
17.	Nassr
18.	Saddam S.E. (Amir)
19.	Salah Al Din S. E.
20.	Taji Fiberglass factory
21.	Taji Metallurgy Laboratory
22.	Tuwaitha
23.	Um Al Ma'arik
24 - 39.	Sixteen sites (See table 2 and figure 1) where water, sediment and biota samples were taken

Table 2

Sample collection sites for IAEA-24

Name of Location	Region No.	Corresponding number on the map
Qaryat Atiq	1	1A
North of Samarra	1	1D
Little Zab (Near Tigris)	2	2A
North of Kuwayr	3	3B
Thar Thar (Outlet Canal)	5	5G*
Uyazam	7	7A
Al Hadar	8	8A
Diyala	9	9A
Al Musayyib	10	10G
Shatt al Basra Canal	10	10J
Al Basrah	10	10F(Alt)
As Samawah	10	10E
Shatt-Nahr-Al-Gharriaf	10	10C
Al Kut	10	36
South of Sarabadi	10	10B

* Two locations.

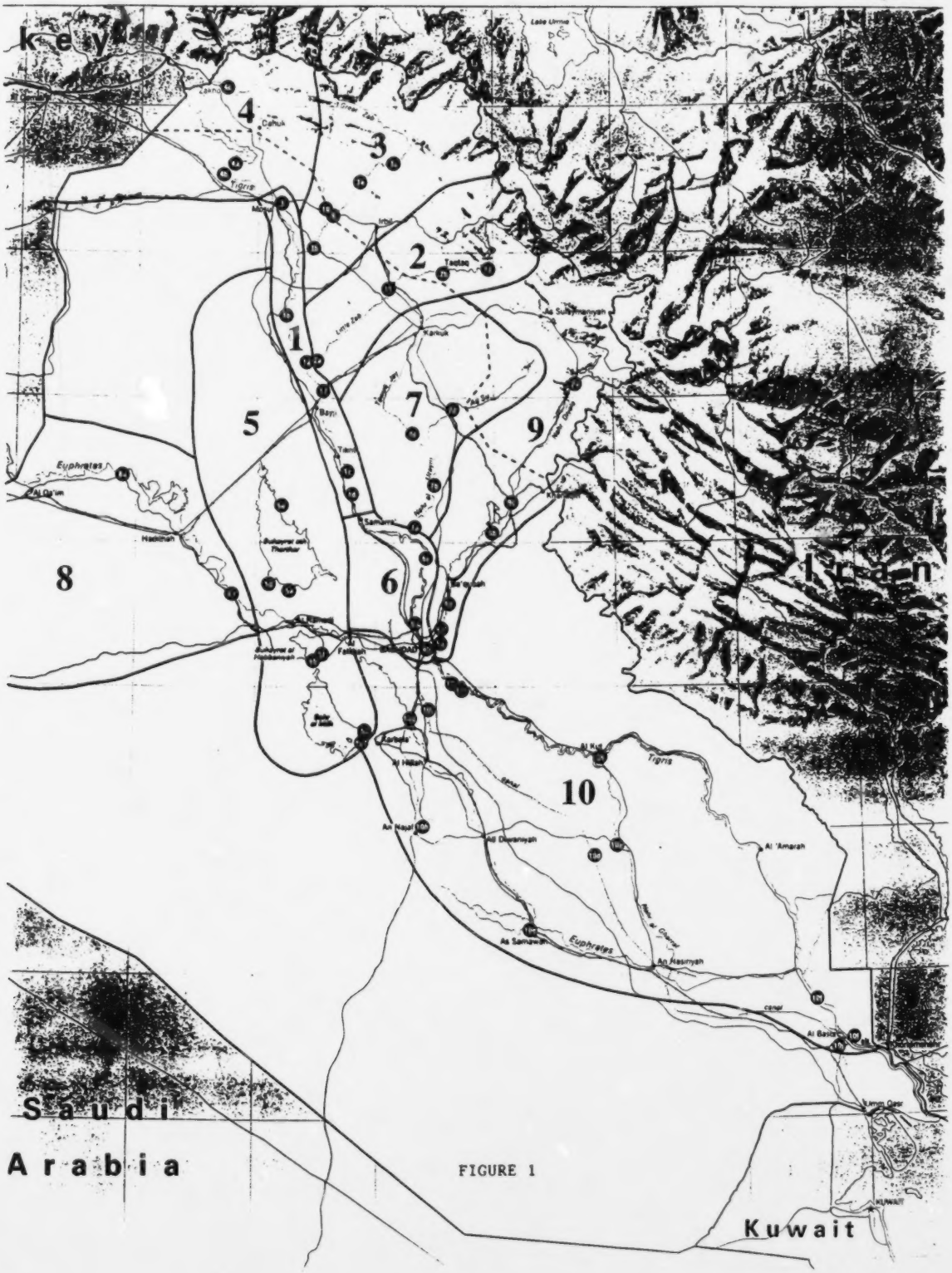
key
1
2
3
4
5
6
7
8
9
10
Iran
Saudi
Arabia
Kuwait
Euphrates
Tigris

FIGURE 1